

REMARKS/ARGUMENTS

Claims 1, 11- 21, 27-36, and 38-46 are pending in the present application.

Claim 27 was objected to as being dependent from a canceled claim, and has been amended to correct the dependency.

Claim 1 stands rejected under 35 U.S.C. §101, the Examiner asserting that the claim "merely describe(s) data transformation" without a concrete and tangible result, and suggesting that the claim recited that information is conveyed to a user or stored for later use. In support of the rejection, the Examiner cites the November 2005 official PTO Guidelines for Subject Matter Eligibility and MPEP 2106 IV B (1)(b). This ground of rejection is respectfully traversed.

There is no basis for rejecting a claim simply because it describes data transformation. As the *November 2005 Guidelines* say, the question is whether the claimed invention, as a whole, is useful and accomplishes a practical application. "In determining whether the claim is for a "practical application," the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is "useful, tangible and concrete." *OG Notices: 22 November 2005 Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility*. The *Guidelines* refer approvingly to the Arrhythmia decision, in which the Court of Appeals for the Federal Circuit found that claims directed to a method of transforming electrical signals constituted statutory subject matter.

The claims in Arrhythmia are similar to those in this application. For example, claim 1 in the Arrhythmia case read as follows:

"1. A method for analyzing electrocardiograph signals to determine the presence or absence of a predetermined level of high frequency energy in the late QRS signal, comprising the steps of:

converting a series of QRS signals to time segments, each segment having a digital value equivalent to the analog value of said signals at said time;

applying a portion of said time segments in reverse time order to high pass filter means;

determining an arithmetic value of the amplitude of the output of said filter; and comparing said value with said predetermined level.”

It should be noted that nowhere does the Arrhythmia claim recited “storing” or “displaying,” as the Examiner says is necessary in the claims of this application. In upholding the claim, the court said:

These (electrocardiograph) input signals are not abstractions; they are related to the patient's heart function. The anterior portion of the QRS signal is then processed, as the next step, by the procedure known as reverse time order filtration. The filtered signal is further analyzed to determine its average magnitude, as described in the specification, by the root mean square technique. Comparison of the resulting output to a predetermined level determines whether late potentials reside in the anterior portion of the QRS segment, thus indicating whether the patient is at high risk for ventricular tachycardia. The resultant output is not an abstract number, but is a signal related to the patient's heart activity.

These claimed steps of "converting", "applying", "determining", and "comparing" are physical process steps that transform one physical, electrical signal into another. The view that "there is nothing necessarily physical about 'signals'" is incorrect.

Arrhythmia, 958 F.2d 1053, at 1059 (emphasis added).

The Court of Appeals for the Federal Circuit further explained the Arrhythmia decision in State Street Bank & Trust Co. v. Signature Financial Group, Inc., Fed. Cir. No. 96-1327 (1998), saying:

“...[I]n *Arrhythmia Research Technology Inc. v. Corazonix Corp.*, 958 F.2d 1053, 22 USPQ2d 1033 (Fed. Cir. 1992), we held that the transformation of electrocardiograph signals from a patient's heartbeat by a machine through a series of mathematical calculations constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it corresponded to a useful, concrete or tangible thing—the condition of a patient's heart.”

In direct analogy to the Arrhythmia claims, the input signal and the resultant output of the process of claim 1 are not abstractions, but practical implementations. Specifically, the input signal of claim 1 relates to a physical phenomenon within a conduit: the transmission of an ultrasonic signal. Similarly, the resultant output relates to a physical phenomenon—the flow velocity of a fluid in the conduit. Thus, just like claim 1 in the Arrhythmia case, claim 1 of the

present invention yields a useful, concrete, tangible result by reciting "providing," "processing," and "determining" of signals. Accordingly, the stated ground of rejection is respectfully traversed.

Claims 1, 11 - 15, 17 - 21, 28 - 36, and 38 - 46 stand rejected under 35 U.S.C. §103 as being unpatentable over Fernald et al. (US Patent Application Publication 2004/0168523) in view of Thompson et al. "Non-Intrusive, Ultrasonic Measurement of Fluid Composition."

Fernald et al. appears to be cited as prior art under 35 U.S.C. 102(e)(see the Office Action mailed August 1, 2006). However, according to 35 U.S.C. 103(c)(1),

"Subject matter developed by another person, which qualifies as prior art only under one or more of the subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were at the time the claimed invention was made, owned by the same person or subject to an obligation of assignment to the same person."

The undersigned states that the present Application Serial No. 10/756,977 and U.S. Patent Publication No. US2004/0168523 of Fernald et al. were, at the time the invention of Application Serial No. 10/756,977 was made, owned by CiDRA Corporation. Applicants therefore contend under 35 U.S.C. 103(c) that the subject matter in Fernald et al. is now disqualified, and therefore the rejection of claims 1, 11 - 15, 17 - 21, 28 - 36, and 38 - 46 over Fernald et al. and Thompson et al. is now moot.

Claim 16 stands rejected under 35 U.S.C. §103 as being unpatentable over Fernald et al. (US Patent Application Publication 2004/0168523) in view of Thompson et al. "Non-Intrusive, Ultrasonic Measurement of Fluid Composition" and Gysling, U.S. Patent no. 6,609,096. However, since Fernald et al. is disqualified for the reasons given above, this ground of rejection is not moot.

Claims 1, 11-15, 17-21, 27-36, and 38-46 stand rejected under 35 U.S.C. §102(b) as being anticipated by Nemade, "IEEE Transactions..." Feb. 1998.

This ground of rejection is respectfully traversed with respect to independent claims 1, 11, and 21, and the claims dependent therefrom. Nemade acknowledges as prior art the

measurement of fluid flow by detection of tagging markers by two sensors at two locations on the pipe, and the use of a cross-correlation function to determine transit time, and a simple arithmetic calculation of velocity. See p. 265, E 1, 2, Fig 1. There is no mention of defining a convective ridge or determining the slope of the convective ridge. Furthermore, Nemade's main disclosure is for measurement of water flow through a pipe by using two ultrasonic transducers diametrically opposite from each other and that issue pulses at the same time and receive each other's signals at two longitudinal locations (Fig.2). Each sensor is both a sender and receiver; the signals are pulsed. Again, cross-correlation is used and there is no mention of defining a convective ridge or determining the slope of the convective ridge.

In contrast to Nemade, the rejected independent claims 1, 11 and 21 relate to a method and apparatus that make use of a determination of a convective ridge or determining the slope of the convective ridge based on the sensor signals. Since no such method is disclosed by Nemade, Nemade cannot properly be viewed as an anticipation of any of claims 1, 11, or 21, or any claim dependent therefrom. Accordingly, the stated ground of rejection is respectfully traversed.

Claim 43 has been amended to include the limitation of claim 44, i.e., that the processor uses an array processing algorithm to determine the flow velocity of the fluid. No such algorithm is disclosed by Nemade, which only discloses the cross-correlation analysis. Accordingly, claim 43 is now allowable.

Claim 41 is canceled.

Claim 16 stands rejected under 35 U.S.C. §103 as being unpatentable over Nemade in view of Gysling. This ground of rejection is moot because claim 16 depends from claim 11, which is allowable over Nemade for the reason given above.

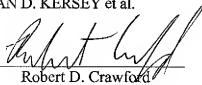
Each of the asserted grounds of rejection have been addressed or traversed. Accordingly, reexamination and reconsideration of the rejected claims is respectfully requested.

A petition for a one-month extension of time under 37 CFR 1.136 is submitted herewith. Please debit Deposit Account No. 50-0260, Order No. CC-0700 for \$120.00 for the one (1) month extension of time. Any deficiency or overpayment should be charged or credited to Deposit Account No. 50-0260, Order No. CC-0700.

Respectfully submitted,

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